

ABSTRACT OF THE DISCLOSURE

Aspects of the invention relate to a turbine engine configuration and method for overcoming a turbine blade tip clearance problem that can arise when the turbine inlet temperature is maintained at a high level during part load operation of the turbine. Aspects of the invention relate to reducing rotor cooling air to a temperature below the design temperature level by using, for example, additional heat extraction devices or by reconfiguring or resizing existing heat exchanger devices. Upon exposure to the cooled air, the discs and blades of the turbine will shrink so as to provide a clearance between the blade tips and surrounding stationary support structure. The design rotor cooling air temperature can be from about 350 degrees Fahrenheit to about 480 degrees Fahrenheit. Aspects of the present invention can be used to decrease the rotor cooling air to about 150 degrees Fahrenheit at about 70 percent load.